

Graphical design elements that should be considered in computer based instruction

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ABSTRACT

Educational technology has emerged as a new field of education because the main means of having access to information has become technology. Thus, basic curriculums in all over the world have been in the process of restructuring; Classical teaching materials have been replaced by technological equipments (Smart boards, tablet PCs, mobile phones etc.) and new materials are designed for these technological tools (Course presentations, notes for distance education, educational software etc.). With the design of teaching materials for technological tools, graphical designs have become one of the most important ways of presenting information. Therefore, instructors should be knowledgeable about graphical design elements such as color of the background, the font used, the size of writing, the density of the text and the relationships among background color and font contrast etc. In this paper, the main focus is the elements to be considered in color selection and harmony which are among the principles of graphic design while designing computer based instruction materials.

Keywords: *Computer based instruction; Computer assisted language learning; Educational software; Educational technology; Graphical design*

INTRODUCTION

Graphic design started with the drawings on cave walls by primitive human beings. The designs drawn on cave walls by first people were the visual reflections of verbal language. Hence, graphic design is one of the ways of a person's expressing himself/herself. Therefore, the choices made by an individual while forming the design include elements of his/her inner world; and like fashion, they change depending on some factors such as the education taken, the environment resided (city, country), upbringing (oppressed, free), gender, politics of the era, technological and scientific developments, peace or war atmosphere etc. In case of graphic design suggestions are not made not to restrict the creativity of the person, only factors to be considered and situations to be avoided can be mentioned (Fiell, 2005). Yet, the design has some basic components and the greatest care should be taken while making educational designs as it is very difficult to correct them.

PRINCIPLES OF DESIGN

Graphic design is viewed to be a discipline in the field of visual arts. However, it has many sub-concepts. The components of design can be subsumed under two categories. These are principles and elements. The basic principles are balance, rhythm, proportion, and unity. Elements are line, shape, texture, white space, mass, value and color (Fidan, 2012). The present study only focuses on the element of color.

Features of color and its use in design

Color is one of the cornerstones of a design. Sometimes, color can lay the basis of creative thinking and all the design is built on color (Wong, 1997, Fidan 2009):

Colors existing together with the light can create various effects on people. There are three dimensions of color: Length (type of the color), width (shade of the color), and depth (intensity of the color).

1. The type of color is the terms used to describe the color such as yellow, red, blue, purple, green, orange etc.
2. The shade of color is its lightness or darkness. When a color is enriched with white color, it becomes lighter, and when black is added, it becomes darker.
3. The density of color is related to brightness. The colors with high density are bright colors.

The most important one among these three dimensions is the shade value of color. The element which describes a visual image best is the shades it contains.

Effects induced by color on people

In addition to reflecting the sensitivity of the designer, the choice of the colors in the design of educational software should be in compliance with the color preferences of the target group. Therefore, it is of great importance to know the effects of colors on people. Some of the effects induced by colors on people are personal and some are generalisable. For instance, warm colors' becoming stimulating and cold colors' being soothing can be considered to be the generalisable effects of colors.

Generalisable effects of colors

Green and blue colors are known to be cold, red and yellow colors are regarded to be warm colors. By bringing cold and warm colors, new colors can be obtained. For instance, a cold color, blue, can be mixed with a warm color, red, then we get a color of blue close to purple. This new color is a bit warmer than blue. In this way, we can have less cold color.

Grays called to be neutral colors can be cold or warm depending on the mixture ratios in their pigments.

While warm colors stimulate and cheer watchers, cold colors soothe and relax them. The reason why restaurants are painted with warm colors is to stimulate visitors to eat fast and in the similar manner, hospitals are painted with cold colors to calm the people who are panicked. Excessive use of cold colors may result in the emergence of gloomy and depressing atmosphere. In the same token, excessive use of warm colors may lead people to aggression.

On graphical surfaces, warm colors seem as if they would leave the surface and they seem in the front. Yellow is the color which is seen at the forefront of all the colors. Cold colors on the other hand give the impression of distance.

Psychological effects of colors

When the psychological effects of color are considered, it is usually accepted that green means jealousy; blue is the symbol of loyalty and sincerity; red represents activity and courage; brown and purple are the symbol of monotony and boredom; white represents submission; black symbolizes pessimism. In addition to these, some researchers argue that red increases blood pressure and pulse beating.

Cultural effects of colors

When the colors are considered from a cultural perspective, they have various connotations. For instance, in oriental culture, the golden yellow is considered to be a sacred color; yet, in some westerns cultures it is the symbol of cowardliness and treason. Red stands for passion. Orange represents science, civilization, energy and power, purple close to blue is the symbol of spirituality and purple close to red is the symbol of courage.

Blue which is a passive and cold color symbolizes both distance and formality and honesty and loyalty. It connotates authority and power. It is cooling and associated with sky, ice and water.

Green is the symbol of freshness and fertility. It symbolizes environment and nature and it is relaxing and soothing. White represents honesty and innocence; black is the symbol of sorrow, gloom, grief and dead. Moreover, it

connotates extreme passion and elegance.

Female and male colors

There are two important concepts to be considered while selecting not only the color of the surface but also the color of the letters of the writing on the surface. These are female and male colors.

Female colors: light color on dark surface. For example; white writing on blue surface

Male colors: dark color on light surface. For example; blue writing on white surface

However, there are no certain formulas showing how to operationalize these concepts in a design. A graphic designer should consider following four elements in color selection:

- 1- Cultural connotation of a color,
- 2- Color preference of the target culture,
- 3- Character of the product,
- 4- Type of approach to design

Things to be considered in color use

The designer should know how colors are perceived by the eye, their wavelength characteristics and their effects on the health of eye. For instance, yellow color is first perceived as purple and the process through which the color is perceived to be yellow is tiring for the eye. Long-time focusing on yellow color may lead to visual disorders. Therefore, yellow should not be selected as the color of surface or front color while designing products requiring long-time reading. Moreover, the designer should be knowledgeable about the effects of visual disorders on the perception of colors by people. For example, he/she should know what color blindness is and what effects it induces; learn how to use red and green colors on the same surface or to create a contrast appropriately so that undesired outcomes can be avoided.

The use of colors in computer assisted language learning software

In most of the educational software programs, pictures, figures, tables etc. are used in teaching of subjects, yet, in language teaching, particularly in teaching of grammar, most powerful elements to enhance teaching are colors. Suffixes and prefixes, tense suffixes, changes and differences in verb inflections can only be emphasized through colors. Look at the following example to teach some suffixes in Turkish (Figure 1):



Figure 1. Educational software sample to teach some suffixes in Turkish

In figure, you can see the subject selection screen of the educational software programs developed by Turkish language pre-service teachers to teach some suffixes in Turkish. In this screen, you can click on the subject you want to learn and then you are directed to the relevant screen (Figure 2).

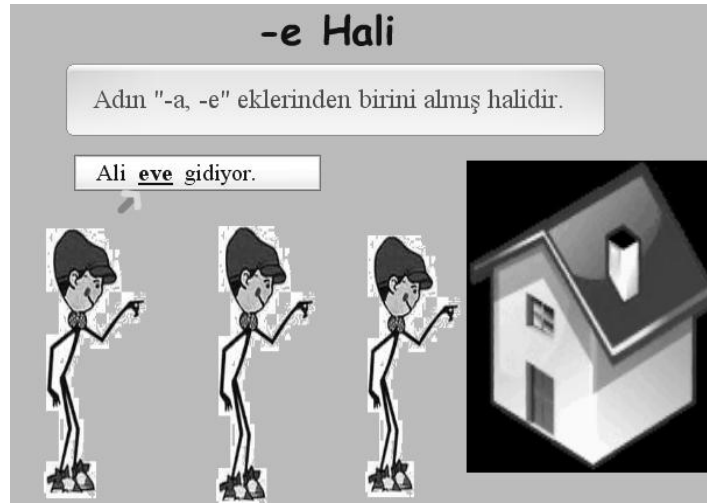


Figure 2. Subject teaching screen (-e suffix added to word “ev”)

In figure 2, there is a hero in this software program: “Ali”. The subject is taught through the activities Ali carries out. As an object “Ev” (house) is selected. Some suffixes are taught by using the interactions between Ali and “Ev”. In the sentence “Ali eve gidiyor”, the purpose is to teach –e suffix. The subject is taught with a sentence. In the example, for better presentation, -e suffix can be shown in a different color or at least it can be underlined or written in bold. In subject teaching, while presenting the word ev(e) in the sample sentence, -e suffix can be zoomed. Moreover, a color inside the house (for example, blue) may be selected, and Ali’s hat, the title of the subject and –e suffix in the title and –e suffix in the sample sentence can be in blue, in this way subject teaching can be consolidated.

In figure 3, the sample sentence is “Ali evde” and here the purpose is to teach –de suffix. In the subject selection screen, Ali’s entrance to the house should be shown through an animation and in this screen, the subject should be taught by showing that Ali is in the house. To teach better, the door of the house can be yellow and –de suffix can also be written in yellow. Moreover, the teaching can be consolidated by making the color of the room where Ali is yellow, subject selection button (-de) in subject selection screen can be in yellow, subject title (figure 3) can be in yellow.



Fig. 3. Subject Teaching Screen (Suffix showing the state of being inside the house)

As a result, every element used in the design (character, surface color, font color, button design, subject title,

sample and explanation) should be designed in such a way that each should complete each other and contribute to the teaching of subject.

CONCLUSION

When the fact that educational technologies are developing fast and all the educational settings will be presented in digital environments in the future is considered, it seems to be clear that the people who will design educational software programs should be knowledgeable about the basic principles of education and main principles of graphic design. In this paper, we focused on one of the most important elements of design, color, and some samples were given here to show how color can be used to make language teaching more effective. It should be noted that "Design is not a magic, many trails are made until the correct design is found (Atasay, 2012)". Therefore, it should be underlined that for good design, much time should be spent on the material. But it is worth doing because in the digital environment, the information can be reached by millions of people.

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